Effects of Nonylphenol on Tail Resorption and Metamorphic Staging in *Rana catesbeiana* Tadpoles

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Abstract

The main objective of this study was to determine the effects of exposure to nonylphenol (NP) on the process of metamorphosis in bullfrog *(Rana catesbeiana)* tadpoles. We were interested in whether NP influenced the rate at which tadpoles progressed through metamorphosis and whether the exposure influenced the rate of tail resorption in the metamorphs. We also wanted to determine whether NP affected these processes through a possible direct or indirect disruption of thyroid hormone (TH) homeostasis. We tested this by adding 3,3',5-triiodothyronine (T_3) to the treatments. Early stage bullfrogs were exposed for 7 days to NP treatments (234, 468 and 936 µg/L) with or without exogenous T_3. Endpoints were measured on day 0 and day 7. In the absence of T_3, NP had a significant effect at 936 µg/L, where it both accelerated the rate of development and increased tail growth. In the T_3 + NP treatments a significant delay in the rate of cranial transformation and stage of tail resorption occurred at 936 µg/L of NP. The rate of limb development was not affected by NP in the presence of T_3. Overall, our results show that NP may be indirectly inhibiting thyroid hormone, thereby affecting tail resorption and some aspects of metamorphic staging.